From: Jim Verboon [mailto:vboonfrms@sti.net]
Sent: Saturday, April 09, 2011 9:32 AM
To: Rogers, Pat@DeltaCouncil; Macaulay, Terry@DeltaCouncil
Cc: russwaymire@sbcglobal.net; vboonfrms@sti.net
Subject: contaminated hatchery feed

Terry and Pat, please pass along to the independent science Board and the Delta stewardship Council the following information. Thank you again Jim

Dear Delta science Board,

As an avid recreational ocean salmon fishermen, I would like to know if your group studied the effects potentially caused from toxic food being fed at hatcheries? The following article appears that it may have been a key cause in the rapid decline of salmon fisheries in the Delta. Since the tainted fish food was supplied in 2002 and 2003 would not we expect to see declines from the poisoning and the years 2005 -2007? I appreciate your due diligence and look forward to your response. Thank you Jim

“Contaminated fish feeds can also affect the quality of edible fish and therefore have the potential to pose human health concerns. Region 2 FWS found that contaminated feeds were a major contributor to elevated arsenic and mercury levels found in fillets from fish raised in a hatchery.”

Chemical Contamination of Hatchery Fish Feed

The Problem

This project addresses the occurrence of metal and organochlorine contaminant residues in commercial feeds purchased by the U.S. Fish and Wildlife Service (FWS) hatcheries. Nutritional problems, which lead to deformities in FWS hatchery raised fish in Region 1, have hatchery managers concerned about both nutritional content as well as purity of manufactured feeds. Studies conducted at Region 2 FWS hatcheries confirm that contaminated fish feeds pose problems to fish health as well as potential human health and environmental problems.

Salmon showing signs of anemia from metals in fish feed.

As more weak and endangered fish stocks are moved into captive environments, ensuring that uncontaminated feeds are available will be crucial in efforts to restore the populations. Since many juvenile salmon migrate through highly industrialized estuaries, increasing the potential they will accumulate contaminants, it is imperative to minimize the levels of these contaminants in the hatchery fish's diet.

Contaminated fish feeds can also affect the quality of edible fish and therefore have the potential to pose human health concerns. Region 2 FWS found that contaminated feeds were a major contributor to elevated arsenic and mercury levels found in fillets from fish raised in a hatchery. Once the problem was discovered, the hatcheries actively procured feeds that contained less of these metal components and metal burdens found in hatchery fish fillets were reduced by 60%.

Salmon with broken back syndrome, possibly caused by high lead concentrations in fish feed.

Fish feeds from various suppliers are used at FWS hatcheries in Region 1 to culture and propagate populations, including threatened and endangered salmon. As managers increasingly rely on captive rearing of endangered populations, the availability of uncontaminated feeds will be crucial to restoration and recovery efforts. A Region 2 - FWS feed study documented that more attention needs to be given to contaminant levels in fish feeds especially for heavy metals and organochlorines. Region 2 FWS has found a wide variability in feed quality over time, with different brands, and with different formulations.

Research into fish feed quality could benefit all hatchery and aquaculture operations and assist in the interpretation of the effects of pollution on wild fish. Results from this study will help us determine if chemical analyses of feeds should be requested prior to purchase. Additionally, this is an opportunity for the Government to provide leadership in determining the concentrations of contaminants in feed that are harmless to fish health. Finally, providing the best quality and least contaminated feeds when raising threatened and endangered fish will help ensure the survival of the fish released and aid in the restoration and recovery of the species.

Objectives

We will develop a handbook for distribution to FWS hatchery personnel. Data from contaminant analyses, recommendations for chemical sampling of feed, summary of the toxicity literature, toxicity threshold reference values for fish, and pathological symptoms will be incorporated into a handbook. The handbook will be distributed to FWS, state, and other hatcheries.

Methodology

Fish feed samples will be collected from hatcheries on a quarterly schedule.

The following is a list of the National Fish Hatcheries that will participate in the study and feeds proposed to be sampled:

Hatchery	Feed Type
Coleman, CA	More-Clark Feed

Hagerman, ID	Abernathy Dry
Spring Creek, WA	Abernathy Dry
Quilcene, WA	Moore-Clark Feed
Garrison Dam, ND	BioOregon Moist Feed
Ennis, MT	Silver Cup
Genoa, WI	Silver Cup
Jordan River, MI	Rangen
North Attleboro, MA	Kelt Diet
White Sulphur Springs, WV	Zeigler

Highlights and Key Findings

Hatchery personnel at 10 hatcheries across the country agreed to provide samples of fish feeds. Samples were collected, composited by batch, and analyzed for percent moisture. A contract for analytical services was set up with the USGS/WRD/National Water Quality Laboratory. Dioxins and furans were analyzed in 29 composite samples of fish feed, by Severn Trent Laboratroies. Analytical results are being evaluated. Data on metals and routine organic contaminants will be available for the first 29 samples soon.

Spring Creek National Fish Hatchery - Columbia River.

Where Are We Headed In 2003

FY 2003 Scope of Work for "Chemical Contaminates in Hatchery Fish Feed"

Chemical analyses of about one half of the fish feed samples will be completed at the beginning of FY 2003. Therefore, the database will not be complete until about midyear or later. Data analysis and interpretation will be conducted after all of the data have been gathered. In the original scope of work, the three objectives below were listed as the final phase of this study. Develop toxicity threshold reference values for each of the contaminants to protect fish health, with special consideration for propagation of threatened and endangered species. A summary of the existing literature will be developed on the effects of each of the organochlorine pesticides, PCBs, PCDD/Fs, and metals found in the feeds. The summaries will include observed effects and concentrations that elicit those effects. A summary table of no observable adverse effect concentrations (NOAECs) will be developed. FDA and other agency tolerances for food meant for consumption by humans will be used heavily in developing this table.

Summarize gross and histological symptoms expected from poisoning by elevated concentrations of the selected pesticides, PCBs, PCDD/Fs, and metals. A review of the literature and search for example photographs will be conducted for each of the chemicals found in our fish feed samples.

Develop a handbook for distribution to FWS hatchery personnel. All of the data on contaminant analysis, recommendations for chemical sampling of feed, summary of the toxicity literature, toxicity threshold reference values for fish, and pathological symptoms described above will be incorporated into a handbook. The handbook will be distributed to FWS, state, and local hatcheries.

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